

**SNOW GLIDING BOARD WITH OUTER FACE HAVING A TRANSPARENT
PROTECTIVE FILM AND PRODUCTION METHOD**

The present invention relates to a snow gliding board with an outer face comprising a transparent protective film. The invention also relates to a method for producing a snow gliding board having a protective outer film.

The finishing of the outer face is an important phase in the manufacture of a snow gliding board, such as an Alpine ski, a snowboard, a monoski, a backcountry ski, a crosscountry ski, etc. The decorative and protective upper assembly intended to provide both the decoration and upper the protection of the board needs to be of high quality, durable, capable of withstanding external stresses and inexpensive. Specifically, this assembly needs to withstand scratches, UV, cold temperatures, humidity, cleaning solvents, etc.

Besides the decorations obtained using various types of colors and pigmentations, efforts have been made to produce particularly attractive optical effects on the outer face of the gliding board and its decorative and protective upper assembly.

Prior Art

A first current technique is known for creating decorations on the outer face of a gliding board, which consists in providing cavities and/or protuberances in the part of the injection mold corresponding to the decorative and protective upper assembly. When the board is being injection-molded, or molded, the upper assembly will adapt very exactly to these cavities and/or protuberances.

When a molding or injection-molding operation is involved, however, and depending on the choice of the materials constituting the upper assembly, as well as the thickness of this assembly, it is not possible to obtain arbitrary reliefs on the outer face of the board. This technique is furthermore found to be particularly expensive, because carving the mold is a very high-precision operation. The mold is economically

viable only after a large production run of injection molding or molding. Such a mould is furthermore very difficult to clean if there are burrs of glue or injection-molding foam.

5 Gliding boards are also known which comprise a decoration having slight reliefs on the outer face, obtained by inserting into the mold an auxiliary piece in the form of a cellular sheet of polymer material, which becomes pressed onto and bonded to the decorative
10 and protective upper assembly.

Such a production method, however, requires precise positioning of the auxiliary piece. Such positioning of a piece will moreover take time and slow down the ski production line. The auxiliary piece is
15 furthermore lost, leading to an extra production cost.

Other methods make it possible to obtain a granular appearance of the outer face of a gliding board, especially in the final production step, by depositing a layer of lacquer or varnish that contains
20 fillers, consisting of particles or lumps, on the decorative and protective upper assembly of the board.

The effect obtained with the very fine asperities, however, is not the most eye-catching for the final user. The size of the lumps is limited, which
25 leads to a fairly fine granular appearance. Lastly, the application of the lacquer layer in these methods can only be carried out with a few specific machines, for example machines involving a screen, which makes it impossible to use spraying.

30 Summary of the Invention

A first problem which the invention proposes to resolve is that of obtaining a decorated outer face which makes the snow gliding board particularly attractive. A second problem is that of creating
35 evocative reliefs reminiscent of the primary function of the board, namely that of being used on snow-covered, cold and/or icy slopes. A third problem is that of being able to provide a snow gliding board with an outer face that is further reinforced. A fourth

problem is that of developing an economical method for producing a snow gliding board, incorporating the decorative final steps carried out after molding or injection molding.

5 A snow gliding board comprises, in particular, an outer face formed by a decorative and protective upper assembly, said decorative and protective upper assembly being covered with at least one varnish film on at least its outer surface.

10 According to a first aspect of the present invention, the varnish film or films form a set of bosses protruding from some or all of the outer face of the snow gliding board.

15 In other words, the bosses are created only by the varnish or varnishes that are used. The outer face of the snow gliding board and the outer surface of the decorative and protective upper assembly are intended to mean the upper areas, that is to say the ones facing upward, which may or may not include the lateral
20 borders and/or the sides.

 Particularly preferably, the set of bosses may form a visible relief decoration on the outer face of the snow gliding board, having an appearance of drops and/or streaks. These drops or droplets, and/or these
25 streaks or trickles, can very spectacularly give an effect suggesting that a liquid having been sprayed and/or having flowed onto this outer face of this snow gliding board has frozen. With such an outer face, the user will have the impression that his or her gliding
30 board has just come out of the freezer. A corresponding image, which is quite analogous, is that of a cocktail glass with frosting obtained on the rim.

 The bosses belonging to the set of bosses may advantageously be distributed randomly over some or all
35 of the outer face of the snow gliding board. The bosses belonging to the set of bosses may have a height substantially lying between 0.2 mm and 1.2 mm. This height may preferably be substantially equal to 0.5 mm. The set of bosses in the form of drops may have a

number of bosses substantially lying between 200/dm² and 2000/dm².

5 The varnish film or films covering the decorative and protective upper assembly may be transparent or translucent, so as to allow the decoration of said decorative and protective upper assembly to be seen.

10 According to a second aspect of the present invention, a method for producing a snow gliding board comprising, in particular, an outer face formed by a decorative and protective upper assembly, by molding or injection molding, furthermore comprises the final steps of:

15 - preparing the outer surface of the decorative and protective upper assembly;

20 - applying a regular first film of a varnish based on acrylate monomers and oligomers that cures under UV radiation, having a dry extract substantially lying between 90 and 100, onto the prepared outer surface of the decorative and protective upper assembly;

- curing the first film under UV radiation with a radiated energy substantially lying between 0.5 J/cm² and 1.5 J/cm²;

25 - applying a second film, with a thickness substantially lying between 20 µm and 120 µm, of a varnish based on acrylate monomers and oligomers that cures under UV radiation, having a dry extract substantially lying between 90 and 100, onto the cured first film by spraying;

30 - curing the second film under UV radiation with a radiated energy substantially lying between 1.5 J/cm² and 2 J/cm²;

35 so as to obtain a set of bosses protruding from some or all of the outer face of the snow gliding board.

With the method, in other words, the outer face is reinforced while creating attractive reliefs. The step of preparing the outer surface of the decorative

and protective upper assembly may advantageously be carried out by a graining or sanding operation. The varnish based on acrylate monomers and oligomers that cures under UV radiation, of the first film and of the second film, may be a varnish selected from the group comprising, individually or as a mixture, urethane-acrylate, epoxy-acrylate, acrylic-acrylate and polyester-acrylate varnishes.

The thickness of the second film may be substantially equal to 40 μm . In a first alternative, the streaks may be obtained at the tip because of its upward slope. In a second alternative, a step of holding the snow gliding board vertical may be inserted between the step of applying the second film and the step of curing the second film under UV radiation, so as to obtain bosses in the form of streaks over substantially the entire length of the gliding board.

A step of decorating the outer surface of the decorative and protective upper assembly may advantageously be inserted, this being placed between the step of preparing said outer surface of the decorative and protective upper assembly and the step of applying the first film.

Brief Description of the Figures

The invention will be clearly understood, and its various advantages and different characteristics will become more readily apparent, from the following description of the nonlimiting exemplary embodiment with reference to the appended schematic drawings, in which:

- Figure 1 represents a diagrammatic view of the various final steps of the method according to the invention for producing a snow gliding board;

- Figure 2 represents an enlargement of the detail A in Figure 1, representing a perspective view of the tip of a first alternative embodiment of a snow gliding board according to the invention; and

- Figure 3 represents an enlargement of the detail B in Figure 1, representing a perspective view

of the tail region of a second alternative embodiment of a snow gliding board according to the invention.

Detailed Description of the Invention

A snow gliding board of a conventional type, such as an Alpine ski (1), comprises a front region with a tip (2), a rear region with a tail profile (3), a central region referred to as the support region (4), two lateral edges (5), an outer face (6) formed by a protective and decorative upper assembly, and a lower face forming the gliding surface (7) bounded on either side by the lateral edges (5).

One method for producing the ski (1) which is commonly employed starts with the various conventional steps of positioning the different constituent pieces in a mould for an operation of molding or injection-molding a polyurethane foam (these are not described and are not represented). The ski (8) is then machined of all its faces, but not yet decorated.

According to the method of the invention, the production of the ski (1) continues with the preparation of its outer face (9). This preparation comprises various steps (I to V) for forming the outer face (6) of the decorative and protective upper assembly.

A first step (I) starts with preparation of the outer surface (9) of the decorative and protective upper assembly by a sanding operation. This sanding is carried out using machines with an abrasive belt, grinders or brushing tools (11). This sanding provides a roughened outer surface (12) of the decorative and protective upper assembly, which is ready to undergo the subsequent steps.

A step (not shown) of decorating the outer surface (12) of the decorative and protective upper assembly, by screen printing or pad printing, may be inserted at this point.

In a second step (II), a regular first film of a varnish based on acrylate monomers and oligomers that cures under UV radiation is applied to the sanded outer

surface (12) of the decorative and protective upper assembly. In order to give good results, for example, the varnish is a polyurethane-acrylate sold by Celliose under the brand name Celluve and the reference 3721 LX.

5 This varnish has a dry extract substantially lying between 90 and 100.

This application is carried out using a machine involving a screen (13) or using a spray gun. Other devices could also be used for applying the first
10 varnish film. For example, the first film (14) has a thickness substantially lying between 60 μm and 100 μm , and preferably equal to 70 μm .

In a third step (III), the first film (14) is partially cured by exposing the outer surface of the
15 decorative and protective upper assembly to UV radiation. For example, a UV tunnel from Giardina (16) delivers a radiated energy substantially equal to 0.5 J/cm^2 . The radiated energy is measured by a UVIMAP detector from EIT.

20 An outer surface (17) of the decorative and protective upper assembly is obtained, the first varnish film of which is crosslinked and cured. The outer surface (17) is ready to undergo the subsequent steps.

25 In a fourth step (IV), a second film of a varnish based on acrylate monomers and oligomers that cures under UV radiation is applied by spraying onto the outer surface with the cured first film (17). In order to give good results, for example, the varnish is
30 a polyurethane-acrylate sold by Celliose under the brand name Celluve and the reference 3721 LX. This varnish has a dry extract substantially lying between 90 and 100.

This application is carried using a spray gun
35 (18) or by spraying. Other devices could also be used for spray application of the second varnish film (19). For example, the second film (19) has a thickness substantially equal to 40 μm before its contraction to form bosses.

In a fifth step (V), the second film (19) is cured by exposing the outer surface to UV radiation. For example, a UV tunnel from Giardina (16) delivers a radiated energy substantially equal to 1.5 J/cm^2 . The radiated energy is measured by a UVIMAP detector from EIT.

An outer face (6) of the decorative and protective upper assembly to UV radiation is obtained, the second varnish film (19) of which is crosslinked and cured. The two varnish films (14 and 19) covering the decorative and protective upper assembly are transparent or translucent, so as to make it possible to see the decoration, for example by pigmentation carried out prior to the injection molding, for the decorative and protective upper assembly. Upon leaving the tunnel, the decorated ski (1) is finished and has relief bosses (21 and 22) obtained by localized contractions of the second varnish film (19).

According to the invention, and in a first alternative embodiment (see Figure 2), the second and first varnish films covering the decorative and protective upper assembly form a set of streaks (21) protruding from a part of the outer face (6) corresponding to the tip (2). These streaks (21) are distributed randomly over the tip (2).

These streaks (21) have a height substantially equal to 0.5 mm and a length substantially lying between 50 mm and 300 mm, preferably substantially equal to 100 mm. The number of streaks (21) substantially lies between $5/\text{dm}^2$ and $20/\text{dm}^2$, preferably substantially equal to $10/\text{dm}^2$.

In a first variant of this first alternative embodiment, the streaks (21) are obtained only at the tip (2) because of its natural slope turned upward relative to the rest of the ski (1).

In a second variant of this first alternative embodiment, the streaks (21) are obtained over substantially the entire length of the ski (1). For this second variant, the ski (1) is held with its tail

(3) pointing downward, preferably substantially vertically, for a few seconds between the step (IV) of spraying the second film (19) and step (V). The length of the streaks (21) will depend on the time for which the ski (1) is held vertical, before the final curing.

According to the invention, and in a second alternative embodiment (see Figure 3), the second and first varnish films covering the decorative and protective upper assembly form a set of droplets (22) protruding from all of the outer face (6).

These droplets (22) have a height substantially equal to 0.5 mm and a diameter substantially lying between 1 mm and 8 mm, preferably substantially equal to 3 mm. The number of droplets (22) substantially lies between $200/\text{dm}^2$ and $2000/\text{dm}^2$, preferably substantially equal to $500/\text{dm}^2$.

The present invention is not limited to the embodiments which have been described and illustrated. Numerous modifications may be made without thereby departing from the scope defined by the context of the set of claims.

All options for decoration remain available. The outer face (6) of a particular snow gliding board (1) could comprise just streaks (21) or just droplets (22), or both streaks (21) and droplets (22). Any regions where the streaks (21) and/or droplets (22) are present or absent on the outer face (6) of a given snow gliding board (1) could be envisaged, according to the manufacturer's requirements.